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भाग 1 लाइन आउटपुट ट्रांसफार्मरों के लिए 'U' कोर

Indian Standard

PERFORMANCE REQUIREMENTS AND METHODS OF TESTS OF TV FERRITE COMPONENTS

PART 1 U CORE FOR LINE OUTPUT TRANSFORMERS

UDC 621·318·124·042·1 : 621·397·332·11 : 621·314·228

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NEW DELHI 110002

April 1992 Price Group 2

Magnetic Components and Ferrite Materials Sectional Committee, LTD 13

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Magnetic Component and Ferrite Materials Sectional Committee had been approved by the Electronics and Telecommunication Division Council.

The object of this standard is to specify the performance requirements and methods of test of U core used in assembly of line driver transformer which is a critical component of B & W television receivers.

This standard (Part 1) is a part of the series of Indian Standards on performance requirements and methods of tests of TV ferrite components. The other parts of the series are as follow:

Part 2 U core for line output transformer, and

Part 3 Core for deflection coil.

Indian Standard

PERFORMANCE REQUIREMENTS AND METHODS OF TESTS OF TV FERRITE COMPONENTS

PART 1 U CORE FOR LINE OUTPUT TRANSFORMERS

1 SCOPE

1.1. This standard (Part 1) covers performance requirements and methods of tests of U-57 cores and U-52 cores for line output transformers.

2 REFERENCES

2.1 The Indian Standards given below are necessary adjuncts to the standard:

IS No.	*Title*
2 : 1960	Rules for rounding off numerical values (*revised*)
7416 (Part 8) : 1985	Dimensions of TV ferrite components: Part 8 U and U core assembly for line output transformer (*first revision*)
7687 : 1980	Methods of measurement for cores for inductors and transformers for telecommunications (*first revision*)

3 REQUIREMENTS

3.1 Materials Characteristics

3.1.1 The material characteristics at 25°C ± 1°C and 16 kHz, unless otherwise specified, are specified in Table 1.

3.2 Electrical Characteristics

3.2.1 The electrical characteristics are specified in Table 2.

3.3 Dimensions

3.3.1 The dimensions shall be according to IS 7416 (Part 8) : 1985.

4 METHODS AND CONDITIONS OF TESTS

4.1 The methods and conditions of tests unless otherwise specified shall be according to IS 7687 : 1980 wherever applicable.

5 MEASUREMENT OF EFFECTIVE PERMEABILITY

5.1 The instrument used, method and conditions of tests for measurement of effective permeability are given below:

Instrument used	L C R bridge
Accuracy	±0·1 percent
Measuring frequency, *Max*	10 kHz
Flux density, *Max*	0·1 mT
Test coil	100 turns (N) with 0·3 mm diameter wire

μ_{eff} is calculated from the formula,

$$L = \mu_{eff}\ \mu_0\ N^2 \times \frac{A}{l} \text{[in MKS]}$$

where 'L' (inductance) is known,

$\frac{l}{A}$ is core factor, and

$\mu_0 : 4\pi \times 10^{-7}$

6 POWER LOSS MEASUREMENT

6.0 The power loss shall be measured by either Substitution Method or Dissipation Method.

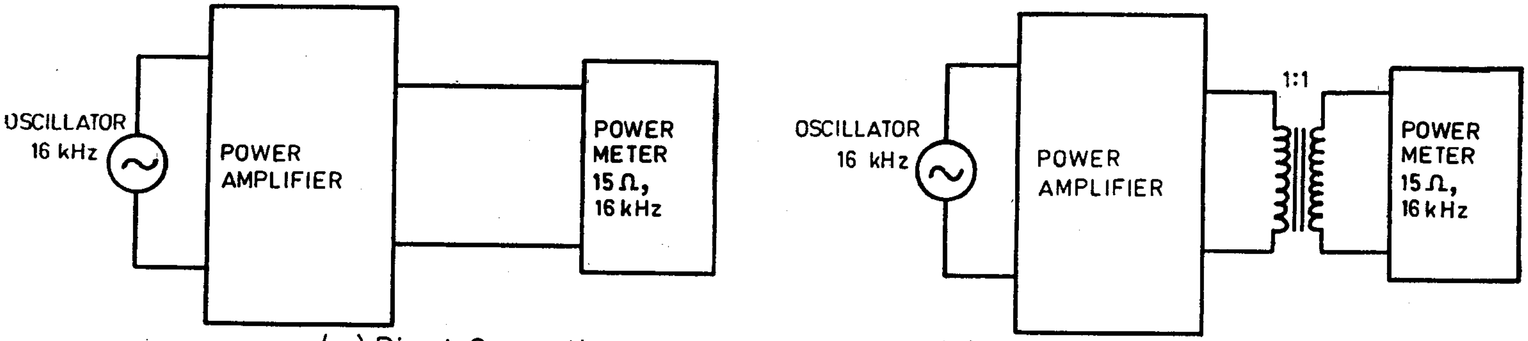
6.1 Substitution Method

6.1.1 Wattmeter, oscillator and power amplifier are the equipments used for the measurement of power loss.

The reference diagram for the measurement of power loss is shown in Fig. 1.

6.1.1.2 The input voltage shall be such as to cause a power loss of 10 watts in a load of 15 ohm and shall create a flux density of 200 mT at 16 kHz in 1 : 1 transformer with 10 turns (N) on the core under test.

6.1.1.3 The difference between the power dissipated in the load connected directly and through 1 : 1 transformer is taken as an approximate measure of power loss in a core.



(a) Direct Connection

(b) Connection through 1:1 transformer

FIG. 1 POWER LOSS BY SUBSTITUTION METHOD

Table 1 Material Characteristics at 25° ± 1°C

(*Clause* 3.1)

Sl No. (1)	Characteristics (2)	Requirements (3)
i)	Initial Permeability (μi)	2 300 ± 25 percent
ii)	Relative dissipation factor ($\tan \delta / \mu i$), *Max*	
	a) At 10 kHz	3·0
	b) At 1 000 kHz	20 0
iii)	Curie Temperature (Tc), °C, *Min*	130
iv)	Flux density (Bs) at H=3 000 A/M, mT	$3\ 900 \times 10^3$
v)	DC resistivity (ρ), ohm-m, *Min*	0·3
vi)	Hysterics material constant (ηB), *Max* (at f=10 kHz and B : 1·5 mT 3·0 mT)	$2{\cdot}0 \times 10^{-6}$
vii)	Relative temperature co-efficient (for θ = +25°C to +70°C), *Max*	$4{\cdot}0 \times 10^{-6}$/°C
viii)	Power loss (kW/m^3) at 200 mT, *Max*	110

Table 2 Electrical Characteristics

(*Clause* 3.2)

Sl No. (1)	Characteristics (2)	Requirements (3) U-57 Core	U-52 Core
i)	Effective permeability (ungapped) (μ_{eff})	2 125 ± 20 percent	2 140 ± 20 percent
ii)	Power loss at 16 kHz 200 mT and 25°C, W/set, *Max*	3·3	1·9

6.2 Dissipation Method

6.2.1 The test coil is designed so that the resonance taking place at test frequency of 16 kHz and the power level of the oscillator is sufficient to create a test flux density of 200 mT across the coil.

The reference diagram for the measurement of power loss by dissipation method is shown in Fig. 2.

6.2.2 At resonance, power loss

= Power dissipated in the core
= V × I

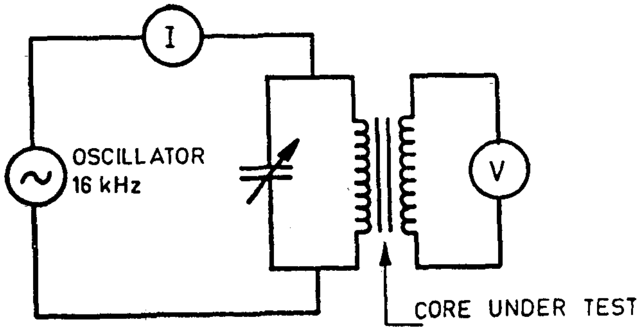


FIG. 2 POWER LOSS BY DISSIPATION METHOD

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